WHAT IS CLAIMED IS:

1. A mixing syringe comprising:

a syringe barrel having a hollow interior and an outlet nozzle at a lower end;

a plunger having a hollow interior reciprocatably disposed in the hollow interior of the syringe barrel;

a mixing rod reciprocatably disposed in the hollow interior of the syringe barrel and having a mixing element at its lower end which is adapted to mix material in the hollow interior of the syringe barrel upon reciprocation of the mixing rod;

said plunger and mixing rod having a first relative position wherein the hollow interiors of the syringe barrel and of the plunger are sealed from each other and a second relative position wherein the hollow interiors are in fluid communication.

2. A mixing syringe as in claim 1, further comprising a frangible seal over the nozzle and a mandrel coupled to the mixing rod or plunger for blocking the seal.

3. A mixing syringe as in claim 1, wherein the mixing disk has openings to enhance mixing.

4. A mixing syringe as in claim 1, wherein the mixing rod is coaxially disposed through a passage in a bottom well of the plunger.

5. A mixing syringe as in claim 4, wherein the mixing rod seals against the passage in the first relative position but not in the second relative position.

6. A mixing syringe as in claim 1, further comprising a sealing cylinder disposed in the hollow interior of the plunger.

7. A mixing syringe as in claim 6, wherein the mixing rod is disposed through coaxially aligned passages on the plunger and the scaling cylinder.

8. A mixing syringe as in claim 7, further comprising sliding seals on the mixing rod which are positioned to seal against the passages on the plunger and sealing cylinder when in the first relative position but do not seal when in the second relative position.

9. A method for mixing a liquid and a second component, said method comprising:

providing the second component at the bottom of a hollow interior of a syringe barrel;

providing the liquid component at the bottom of a hollow interior of a plunger;

moving a mixing rod relative to the plunger to release the liquid from the plunger into the second component in the syringe barrel by gravity; and

reciprocating the mixing rod to mix the liquid component of the second component together.

10. A method as in claim 9, wherein moving the mixing rod comprises axially advancing the mixing rod relative to the plunger to open a liquid flow path between the hollow interior of the plunger and the hollow interior of the syringe barrel.

11. A method as in claim 10, wherein the mixing rod has an annular depression which aligns with a passage in a bottom well of the plunger to open the liquid flow path.

12. A method as in claim 9, wherein the liquid is a liquid component of a bone cement and the second component is the powder component of a bone cement.

13. A method as in claim 12, wherein the powder component comprises a component selected from the group consisting of autograft bone material, granulated coral, demineralized bone material, calcium phosphate, and poly (methyl methacrylate) cement; and the liquid component comprises a component selected from the group consisting of a buffered aqueous solution, glycerol, and methyl methacrylate monomer.

14. A method as in claim 9, wherein the mixing rod is axially reciprocated.

15. A method as in claim 9, wherein the mixing rod is rotationally reciprocated.

16. A method as in claim 9, further comprising advancing the plunger to extrude the mixed components from the syringe barrel.

17. Apparatus for production of mixtures of two components with a container for one component (preferably liquid component) and a container for the other component (preferably powdered component), and with devices for combining the two components in a mixing space, and devices for extrusion of the finished mixture, characterized by the fact that the powdered component 4 is situated in the lower part of the inner space 21 of the outer hollow cylinder 1, which is closed on its lower end with a bottom 10 that carries a nozzle 2 that is sealed relative to inner space 21 by means of a closure membrane 3, whereas the upper part of the inner space 21 is closed by the lower wall 6 of the inner hollow cylinder 5, in which a sliding seal 8 is present for the required sealing, and that the liquid component 9 is situated in the inner space 18 of the inner hollow cylinder 5, which is arranged like a piston in the outer hollow cylinder 1 and is closed on its lower end by the lower wall 6, whereas its upper end is closed by the upper wall 11, and that the lower wall 6, as well as the upper wall 11, each have an opening with the sealing lip 7 and 12 that are closed by those parts of the mixing rod 15 that have the larger diameter 17, and that on the lower part of the mixing rod 15 a torus 20, a section with smaller diameter 19, a mixing disk 22, as well as a mandrel 24 are present.

18. Apparatus according to claim 17, characterized by the fact that a plastic enclosure is present, in which the apparatus according to the invention is sealed airtight.

19. Apparatus according to any of claims 17 or 18, characterized by the fact that the outer hollow cylinder 1 has an annular flange 14, the inner hollow cylinder 5 has an annular flange 13 and the mixing rod 15 has a flange plate 16.

20. Apparatus according to any of claims 17-19, characterized by the fact that openings 23 are present on the mixing disk 22.

21. Apparatus according to any of claims 17-20, characterized by the fact that a mandrel 24 is present on the lower end of the mixing rod 15.

22. Apparatus according to any of claims 17-21, characterized by the fact that an inside thread 29 is present on the inside of the outer hollow cylinder 1 in the upper region, whereas an outside thread 28 is present on the outside of the inner hollow cylinder 5.

23. Apparatus according to any of claims 17-22, characterized by the fact that knurling 30 is present on the annular flanges 13 and 14.

24. Apparatus according to any of claims 17-23, characterized by the fact that an annular groove (37) that accommodates the sliding seal 8 is situated on the inner periphery of outer hollow cylinder 1.

25. Apparatus according to any of claims 17-24, characterized by the fact that an operating part 31 is present on the annular flange 14 of the outer hollow cylinder 1 that consists of a connection part 32, a spring element 33, an operating element 34, as well as a detent 35, and that toothing 36 is present on the outer periphery of the inner hollow cylinder 5.